Poster Abstracts

1. Sustainable and Healthy Food Profiling Models to inform the creation of food labels that account for nutrition and the environment- a Systematic Review

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To help the transition to a healthy and sustainable diet, there needs to be a standardized scoring system to classify food products as healthy and/or sustainable. 'Sustainable and Healthy Food Profiling Models' (SHFPM) are the basis for labelling food products according to their environmental and nutritional impact in order to enable consumers to make informed and sustainable choices. This review was conducted to provide policy makers with the necessary information to develop their own healthy, sustainable dietary guidelines and front-of-package food labeling to support population health and sustainability.

We used a systematic approach to provide an overview of potential SHFPM, their characteristics, and cut-off values for classification. More than 2000 publications were returned, with 12 SHFPMs meeting the study inclusion criteria: 'models that score individual foods and consider at least two environmental impact factors`. The included SHFPMs considered a total of 14 different environmental indicators, with most models focusing on greenhouse gas emissions (n=12), water use (n=11) and land use (n=9). We discovered different approaches to combine the nutritional quality and the environmental impact of food products. Further model advantages included a great variety in methods and databases that can be combined for the intended use, respectively: a wide range of system boundaries, reference values, approaches for defining cut-off values, design proposals for food labelling schemes, lifecycle inventory databases and thus a comprehensive geographical scope. Key disadvantages of identified models included: inconsistent methods for food classification, with many classification systems being politically rather than scientifically determined; a lack of replicability due to clear methods, available code, and clear cut-off values. Additional research is therefore needed to develop national and international reference values in order to allow for standardized food labelling.

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2. What do you mean by 'food security'? Inflected agrarian policymaking within the Caribbean Community (CARICOM).

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Food security among indigenous communities in the Americas has been an issue addressed by governments, multilateral organizations, and other stakeholders for over four decades. Within the Caribbean Community (CARICOM), Guyana is commonly referred to as the regions "breadbasket," but its food policies have not always engaged well with the concerns of Toshaos, a title given to indigenous leaders, or provided a stable level of food exports for the country. This project uses the case of cassava production in Guyana and CARICOM to understand how different groups

conceptualize ‘food security,’ and how governmental food policies affect indigenous livelihoods. How do these conceptualizations highlight longstanding tensions between first peoples and settler communities and what policy mechanisms are there to include the voices of Toshaos? Finally, how does the concept of inflected agrarianism provide a useful ideological platform to discuss this issue within other CARICOM member-states? I examine how these varying definitions of food security drive agricultural policy by engaging with a spectrum of organizations at the international, national and local levels. With over thirteen months of fieldwork involving interviews and conversations with development experts, government ministers, parliamentarians, policymakers, indigenous rights activists, local offices of international organizations and NGOs, and Toshaos I will discuss how varying interpretations of food security directly influences national policymaking.

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3. In the shoes of a farmer: (re)connecting the public with livestock production

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An interactive public engagement activity explored public perceptions of livestock health and welfare, and farmer and consumer decision-making. The investigation was framed around the ways in which the public are concerned about, but disconnected from the realities of livestock agriculture, as well as the changes taking place in the way agriculture in the UK is governed post-Brexit. Public engagement could provide individuals with a space to reconnect with agriculture, and to build greater trust in policymaking. The activity focused on the management of Bovine Viral Diarrhoea in a UK dairy cattle herd.

A pilot was held at The Museum of English Rural Life in Reading, Berkshire. The main activity was held over two days in Newcastle-upon-Tyne. It had three stages. 1) A choice game, in which participants made trade-offs between animal health and farm profitability. 2) Short ‘post-it note’ questions and comments. 3) Interviews with an opportunistically sampled sub-set of participants. 186 participants completed the game, 295 post-it note responses were obtained, 52 follow-up interviews were conducted.

The findings indicate that the public have a strong interest in farming and livestock health and welfare, a long memory of previous livestock disease events, and a preference for high welfare standards and local produce. However, these preferences are often tempered with economic considerations. The public value opportunities to discuss and learn more about food production, with there being limited opportunities to do so. Participants were able to think about complex and potentially ethically difficult issues, including animal health, as well as sustainability, and trade-offs in farmer and consumer decision making. We conclude with the suggestion that more, creative opportunities for discussion would be welcomed by the public and could help to address the disconnect between the public and the food they consume.

4. Beyond pasture for land speculation: the resilience of dairy farming in the rural-urban periphery of Rio de Janeiro, Brazil

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The densification of cities is presently one of the dominant strategies for urbanisation globally. However, how the densification of cities is linked to geographical processes in rural-urban landscapes is rather unknown. From the 1970s onwards, land speculation in the rural-urban periphery of Rio de Janeiro, Brazil, prompted increasing competition between industrial, residential, and conservation uses and their general advance against agricultural land uses. These pressures have created a highly multifunctional countryside in which agriculture and dairy farming has become juxtaposed with other functions and interests as part of a mosaic of diversified land uses.

Empirical findings of this study indicate how the resilience and adaptive capacity of small-scale dairy farming have challenged dichotomous urban-rural approaches to land use in peri-urban areas in which agriculture and localised food systems are simply replaced by urban sprawl and global pressures. Land tenure and social formation are results of past agrarian history and influence the course of converting farm-land into other uses as well as influencing resistance and dynamic adaptation at the rural-urban interface. Dairy farming in rural-urban fringe areas is characterised by fragmented patterns of land ownership, the predominance of small-scale farms, products with aggregated value, and more direct forms of commercialisation to local consumers. Farmers sell milk to small and medium-scale local dairies, many of which were set up by groups of farmers and this aggregates value and quality, promoting sustainable and resilient farming systems in the rural-urban periphery of Rio de Janeiro.

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5. Organic Beef Production and Inequality in Consumption: Contradictions in the Transition to Sustainable Food Systems

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The transition to sustainable food systems is a challenging task especially in countries like Brazil in which conventional agribusiness is dominant and plays a key role not only in the domestic market but also in global food markets. Cattle raising is an important part sector in the Brazilian economy and in historic land use. This paper examines how organic beef production became the focus of certain ranchers in Mato Grosso do Sul State, which is located in the Central West, the main Brazilian agribusiness commodity region. The paper also explores contradictions present in the consumption side of organic beef production with regard to domestic and global markets.

The specific objectives are to highlight the advantages present in alternative food production systems which motivate a certain kind of rancher to enter this sector as well as to identify the type of consumer who buys organic beef. Research method involved interviewing organic ranchers and visiting their installations in production areas as well as investigating the marketing chain which delivers this kind of beef to domestic consumers in Campo Grande, the capital of Mato Grosso do Sul state, and in Rio

de Janeiro, the second largest metro area of Brazil. Organic beef production was found to be up to 40% cheaper to produce and the price received by ranchers up to 15% higher than in mass-produced beef production. In the urban consumer market customers pay a premium of from 20% to 30% more. Organic beef is sold in up-scale butcher shops and supermarkets located in rich neighbourhoods. Beef is a basic item of the Brazilian diet but ordinary consumers cannot afford organic beef so that much of the production goes to elite consumers or is exported to Europe. This basic contradiction in turn hinders the transition to sustainable beef production in Brazil.

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6. Testing the Early Effectiveness of a Self-Regulation Intervention for the Reduction of Meat Consumption – Protocol of an Online Randomised Controlled Trial

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Background: Food habits strongly predict meat consumption, often overriding intentions to reduce meat intake. People who are motivated to change their meat-eating habits might therefore require support to do so. This trial aims to assess the early effectiveness of an online self-regulation intervention helping individuals to reduce their meat consumption.

Methods: The online two-arm parallel group randomised controlled trial will last 9 weeks from baseline to second follow-up. 150 participants who wish to reduce their meat consumption and usually consume meat >5 times a week will be recruited. Participants will be randomised 1:1 to either the control or intervention group. Both groups will track their meat intake on a daily basis during weeks 1 (baseline), 5 (follow-up 1), and 9 (follow-up 2). The intervention group will be encouraged to follow the self-regulation intervention during weeks 2-5, including daily monitoring of meat intake, daily planning of actions to reduce meat consumption, and weekly evaluation of tried actions. During weeks 6-9, the intervention group will be asked to continue with the actions they found useful. At baseline and at the end of weeks 5 and 9, all participants will complete self-efficacy and meat identity questionnaires. At the end of week 9, participants in the intervention condition will complete an intervention evaluation.

Analysis: Using regression analysis we will compare changes in average daily meat consumption from baseline to second follow-up between the control and intervention group. We will test whether any change is mediated by participant's self-efficacy to reduce meat intake. We will also test whether participant's meat identity changes. A process evaluation will assess the intervention's feasibility and acceptability.

Conclusion: This trial will assess the acceptability and early effectiveness of an online self-regulation programme to reduce meat intake, which could be rolled out at scale to support a more sustainable diet.

7. Red meat, poultry, fish and dairy intake and risk of cardiovascular disease: an 11 year prospective cohort study of Chinese adults

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Background: Higher red meat intake and lower fish intake have been previously associated with increased risk of cardiovascular disease (CVD), while the relevance of poultry and dairy intake in CVD incidence remains inconclusive. Nevertheless, evidence from China is very limited, and we therefore investigated the associations of red meat, poultry, fish and dairy intake with risk of major CVD events in Chinese adults.

Methods: The China Kadoorie Biobank is a prospective study, which recruited ~512,000 adult participants from ten diverse localities during 2004-08. At baseline and periodic resurveys, information on the consumption frequency of major food groups was collected using a validated interviewer-administered laptop-based questionnaire. During an average follow-up of 10.8 years, 43,262 incident ischemic heart disease (IHD) events, 41,183 ischemic strokes (IS) and 9359 intracerebral haemorrhages (ICH) were recorded among the 489,595 participants, who were free of CVD at baseline. Cox regression was used to calculate adjusted hazard ratios (HRs) relating dietary exposures to CVD risk.

Results: There were 47.2%, 28.2%, 9.0% and 11.3% of participants at baseline who regularly consumed (i.e. ≥4 days/week) red meat, poultry, fish and dairy, respectively. After adjusting for potential confounders, only dairy consumption was positively associated with risk of IHD, with each 50 g/day increase in estimated habitual dairy consumption being associated with 12% higher risk (HR 1.12 [95% CI 1.09-1.14]). Risk of IS was not significantly associated with consumption of these foods. However for ICH, inverse associations were found with intake of red meat, fish and dairy, with adjusted HRs for 50 g/day higher intake being 0.82 (0.77-0.88), 0.85 (0.74-0.99) and 0.82 (0.71-0.94) respectively.

Conclusion: In Chinese adults, higher intake of dairy was associated with a higher risk of IHD, whereas higher intakes of red meat, fish and dairy were each associated with a lower risk of ICH. Further investigating the factors that might mediate the observed associations is required.

8. The role of trade agreements in improving the sustainability of food supply chains

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Between one quarter and two thirds of all anthropogenic material, energy, and land use, as well as deforestation and greenhouse gas emissions are embodied in global trade flows. While efforts to address the underlying drivers of deforestation, for example the overconsumption of resource-inefficient foods such as meat and dairy, are critical, especially when consumption rates in richer nations far exceed sustainable levels, such efforts must be complemented by stricter trade policies. After two decades of negotiations, in 2019 a historic trade agreement was provisionally reached between the EU and the Mercosur bloc (Brazil, Argentina, Paraguay, and Uruguay). The Mercosur bloc and neighbouring countries are undergoing rapid conversion of forests, savannas, and wetlands to meet rising domestic and global demand for meat and livestock feed. Due to ongoing imports of these commodities from the Mercosur bloc, the EU is responsible for one football pitch of deforestation every 3 minutes.

We find that EU-Mercosur agreement fails to protect local communities and the living world. We shine a light on how trade could be used as a leverage point for a brighter future – rather than fuelling further destruction. Our three tenets of sustainable trade – inclusion, transparency and enforcement - provide policymakers, producers, consumers, and the wider international community with a clear and practical pathway towards supporting human rights, a habitable climate, and a healthy environment. Ultimately, achieving sustainable trade will depend on a transformation of the objectives of trade agreements, where global actors recognize that working together to protect human rights and the living world is fundamental to long-term prosperity.

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9. Associations between dietary fat from different sources and blood lipids in the UK Biobank study.

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Background: Blood lipids, and in particular total cholesterol and low-density lipoprotein cholesterol (LDL-C), are established risk factors for cardiovascular disease (CVD). However, it is unclear whether fat intake relates differently with blood lipids depending on its dietary source, and understanding these relationships may be important for CVD prevention.

Aim: To examine the associations between intakes of fat from different dietary sources and blood lipids in the UK Biobank study.

Methods: We studied 27,586 participants with average daily intake of fat calculated from > two 24-hour dietary assessments. Fat intakes from different dietary sources as a percentage of energy intake were converted into quintiles. Blood lipids were measured in serum collected at baseline. Multivariable linear regressions were conducted to calculate geometric mean concentrations of blood lipids according to quintiles of fat intakes.

Results: Intake of fat from animal sources was associated with higher total cholesterol (3.66% difference in geometric mean between highest and lowest quintile of intake; 95% confidence interval; 3.02 to 4.31%), LDL-C (3.97; 3.16 to 4.77) and high-density lipoprotein cholesterol (HDL-C) (4.31; 3.51 to 5.11), and lower triglycerides (-4.61; -6.31 to -2.91). In contrast, fat from plant sources was inversely associated with total cholesterol (-1.09; -1.75 to -0.43) and LDL-C (-1.42; -2.24 to -0.61). Fat from non-dairy animal sources was more strongly associated with higher total cholesterol and LDL-C and less strongly associated with higher HDL-C and lower triglycerides, when compared to the associations for fat from dairy.

Conclusion: Fat from animal sources was associated with worsened total cholesterol and LDL-C, while opposite associations were found for fat from plant sources. Although both fat from dairy and non-dairy sources were associated with a less favourable lipid profile, the associations for fat from non-dairy sources were stronger.

10. Distancing death: consumption, slaughter and welfare in the British halal meat industry

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Halal meat accounts for a growing proportion of global meat intake, and in the context of rapidly increasing global meat consumption, it is important to investigate halal meat consumers' motivations and priorities for such consumption. Preliminary PhD fieldwork results will be presented to explore the ways in which a concern for halal intersects with a concern for animal welfare, health and environmental sustainability, and how these have implications for the scale, practices and understandings of meat consumption. Interviews with producers and slaughterers as well as consumer surveys are used to understand how animal death is addressed by different stakeholders in the British halal meat industry. Moreover, the project explores the policy implications of considering animal welfare in the British halal meat industry, including whether a national halal standard can be established, which is a complex issue given the existence of multiple competing bodies and food standards. The treatment of animal death and animal welfare in the British halal meat industry is a topic that aims to make contributions to debates across many disciplines and sub-fields, in particular animal geography, geographies of food, animal ethics and anthropology.

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11. Using GWP* to demonstrate warming contribution over time for a beef study-farm

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Livestock production contributes to anthropogenic climate change primarily through emissions of the greenhouse gases methane (CH4), nitrous oxide (N2O), and carbon dioxide (CO2). These three gases have distinct atmospheric lifetimes, from relatively short (decades; CH4) to extremely long (millennia; CO2). Typically, climate impact assessments use simplifying 'emission metrics' that describe each gas as single weighted 'CO2-equivalents' (most commonly using the 100-year Global Warming Potential). This approach loses temporal detail, obscuring how the different gases dynamically contribute to global temperature change. Here, a novel emission reporting approach, GWP*, is used to illustrate the dynamic warming impacts of emissions (and mitigations thereof) from a beef production system representative of temperate grassland regions.

Using real farm data from a system-scale grazing trial in South-West England (the North Wyke Farm Platform), we illustrate the warming over time resulting from beef production. We use a simple climate modelling approach to show gas specific dynamics over a 200-year period. Longer-lived CO2 and N2O act cumulatively, increasing warming while the emissions continue. For shorter-lived CH4 there is a large initial impact of introducing a new emission source, but relatively little warming beyond this point (occurring in the first few decades) as continued emissions replace natural removals. Several notable points are revealed: for example, even when using an emission factor at the low end of current estimates of uncertainty, CH4 emissions contribute the greatest to warming initially, but the impact of N2O becomes greater (and increasingly so) if emissions are sustained for 50-80 years (depending on which N2O emission factors are utilised). We show how GWP* can capture these

dynamics by handling short- and long-lived gases separately, while also highlighting the importance of carrying forward gas-by-gas uncertainties contributing to a total carbon footprint. We also illustrate and discuss implications for timing and prioritisation of gas specific mitigation strategies.

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12. Acceptability of policies to reduce consumption of red and processed meat: A population-based survey experiment

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Background: Few studies have investigated the public acceptability of meat reduction policies, yet acceptability may influence intervention effectiveness and shape decisions on policy actions. We aimed to establish the acceptability of policies to reduce red and processed meat consumption, and whether acceptability differs when presenting policies as specifically benefitting (a) health or (b) the environment.

Methods: In an online survey, 2215 UK adults were randomised to see text that described potential meat reduction policies as having either a health or environmental benefit. Participants rated the acceptability of the same six policies (media campaign, incentives for beef producers to switch to pulses, labels on products highlighting harms, reducing availability of meat options, increasing price, and banning advertising). Policies were presented in a random order.

Results: Labels were the most acceptable policy (48% support), followed by a media campaign (45%), reduced availability (40%) and providing incentives (38%). More people opposed than supported banning advertising (45% vs. 26%) or increasing price (57% vs. 27%). No evidence was found for a difference in acceptability between the health vs. environment conditions (-0.06, 95%CIs:-0.18, 0.07). Intentions to reduce meat consumption, concern over the environment and beliefs that reducing meat consumption would be beneficial for (a) health and (b) the environment were all associated with higher acceptability across policies.

Conclusions: There was no differential effect of framing policies as benefiting health or the environment. All policies, except banning advertising and price increases, were supported more than opposed, suggesting substantial segments of the population would accept measures to reduce meat consumption. Consistent with previous evidence, interventions relying on conscious decision-making had greater public support than interventions targeting industry actions or imposing fiscal penalties. Further research is needed to identify whether presenting evidence of policy effectiveness might increase acceptability of less popular but potentially more effective meat reduction policies.

13. Associations of major foods with risk of myocardial infarction: UK prospective study of 649 300 Million Women Study participants

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Background Many previous prospective studies have shown inverse associations between fruit, vegetable, and wholegrain consumption and risk of ischaemic heart disease (IHD). Some such studies have also shown a positive association between red and processed meat consumption and risk of IHD and an inverse association for fish. These findings are inconsistent, however, and associations are unclear for poultry, dairy, and eggs. We investigated associations of major animal and plant foods with risk of myocardial infarction (MI) in a large UK prospective study using an exposure-wide approach.

Methods A total of 649,300 women, aged 60 (SD5) years, without previous heart disease, stroke, or cancer were followed by record-linkage to national hospital admission and death databases. Baseline diet was assessed in 2000-2004 using a validated questionnaire, calibrated with a repeat online 24-hour dietary questionnaire from a sub-sample (7%). Multivariable-adjusted Cox regressions, corrected for multiple testing, yielded relative risks (RR) and 99% confidence intervals (CIs) for MI associated with consumption of 13 dietary items. Trends in risk across baseline intake categories were calculated by assigning mean values from the re-measured intakes.

Results During 15.1 years follow-up, 13,439 women had a first hospital admission or death from MI. Risk of MI was not significantly associated with consumption of red meat, processed meat, poultry, oily fish, non-oily fish, milk, dairy desserts, eggs, vegetables, or wholegrains Risk of MI was, however, inversely associated with higher consumption of fruit (per 100g/day intake, RR=0.90;95%CI 0.86-0.95,P trend=2.1 x 10-8) and cheese (per 10g/day intake RR=0.93;0.87-0.99, P trend=0.002).

Conclusions There were no significant associations of MI risk with meat, poultry or fish, but intakes of meat and fish were, on average low, with limited variability. Higher intakes of fruit and cheese were associated with lower MI risks, but the magnitudes of these associations were small and residual confounding is possible.

14. The right to be sustainable: A case study of the Portuguese law that compels public canteens to provide vegan options in their menus

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Given the undeniable relation between food choices and the current climate crisis, there is a clear need to facilitate access to more sustainable diets, such as the vegan diet. No less important is the need to guarantee access for those who already choose to exclude animal products from their diets, interrupting the discrimination to which they are subjected. The Law nº 11/2017 approved in Portugal establishes the obligatory offering of a vegan meal option in the menus of public canteens and seeks to meet these needs. For this reason, the present study analyzes the Portuguese experience and extracts relevant elements for those seeking to implement similar public policies in other countries. An exploratory case study was conducted using data from documents and interviews with the policy cycle model as an analytical framework to structure the research. The results revealed the importance of the political context when bringing this topic onto the political agenda but also pointed out the importance of a strategic approach, prioritizing citizens´ civil and constitutional rights, in the mobilization and support of the most diverse actors, a fundamental factor for the approval of the law. Furthermore, successes and problems were identified in the implementation of the law, as well as in the evaluation stage. Beyond the advice to policy-makers, these findings may inspire further research on this topic that has not yet been extensively explored.

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15. Testing the effects of environmental labelling on food selection using an experimental online supermarket platform

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Background

To enable consumers to make environmentally informed purchases, they need clear and accurate information about the environmental impact of food products. Here, we explore the effects of environmental sustainability labels (ecolabels) on consumer purchases in a virtual online supermarket.

Methods

Two studies were conducted using a virtual supermarket platform to explore the effects of ecolabels on the purchasing behaviour of UK adults. In Study 1 (N=1055), the effects of three ecolabel designs were explored: a single, composite environmental impact score ecolabel; a complex multi-indicator ecolabel; and a combination of both. In Study 2 (N=5060), four ecolabel designs were tested: two single, composite (A-E score) designs and two simple badges, highlighting “better” or “worse”

environmental impact products. Both studies included a no-intervention control condition. Participants were randomised to a study condition and completed a shopping task using a pre-specified 10-item shopping list.

Results

For Study 1, a linear regression found that, in comparison to the control condition (total impact= 58.8), the single composite score ecolabel (-12.2), the multi-indicator ecolabel (-11.6) and the combination of both ecolabels (-9.9) showed a significant reduction (in percentile points) of the environmental impact of the shopping basket. There were no observed differences in the nutrient profile or total cost (in £) of the shopping basket between groups. This study was not powered to test differences between ecolabel conditions. The analysis of

Study 2 will investigate differences in ecolabel effectiveness, and will be completed by the time of the conference.

Conclusions

Study 1 provided preliminary evidence that ecolabelling is effective at promoting sustainable purchasing behaviour. These results are promising evidence that ecolabelling can promote sustainable purchasing without negatively impacting the nutrient composition or total cost of the shopping basket.

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16. Stakeholder arguments in the UK meat tax debate: An interpretive policy analysis

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With calls for Western industrialised countries to reduce their meat consumption becoming increasingly prevalent, meat taxes are a specific policy lever that has been suggested. In the UK, meat tax advocates and critics hail from a variety of disciplines and perspectives, and the topography of the debate is complex. In this interpretive policy analysis, we conducted key stakeholder interviews to investigate and categorise the different arguments being employed. Using political ideologies and perspectives on sustainable food security as theoretical lenses, we explored how these arguments fit into broader ideas about human nature, the role of the state and solutions to food system challenges. In general, meat taxes were supported to reduce greenhouse gas emissions, improve population health and improve animal welfare. They were opposed for being unfair to low-income households, for being an inappropriate state intervention that threatened people's liberty, and for posing a risk to animal welfare and rights. Pro-meat tax arguments often aligned with political ideologies that see state intervention as enabling positive liberties or restricting citizens for their own good, and sometimes echoed the demand restraint or food system transformation perspectives on sustainable food security. Arguments against meat taxes were more likely to align with the efficiency perspective or classical liberal ideology. Despite having some similarities with other recent debates around taxation- particularly taxes on sugar sweetened beverages- the meat tax debate contains unique complexities due to the presence of environmental arguments, and differing values pertaining to animal welfare and rights.

17. Restoring nature at lower food production costs

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Agricultural activity and upscale demand for land, water and energy exert a range of pressures on natural ecosystems, calling for global strategies to ensure affordable food production at minimum environmental costs. Studies suggest trade-off relationships between environmental quality and food prices. Nevertheless, evidence based on empirical cost functions supporting trade-offs between food security and environmental performance is still limited at a global scale. Here, we develop a cost engineering modelling and demonstrate that optimised spatial allocation of ten major crops, would result in a decrease in current costs of agricultural production by approximately 40% while significantly improving the environmental performance. Even though production inputs increase at local scales, an improved overall cost effectiveness results as slightly higher costs per unit of output at field-scale are overcompensated by a cumulative release of cultivated land of 50%. Our findings indicate that long-term food prices are bound to continue to decrease and even be accelerated to decrease under strong environmental policies. Land policies supporting sustainability transitions should target the local barriers to the implementation of high-yield regenerative agricultural practices contributing to the production of multiple regional and global public goods.

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18. Associations of circulating insulin-like growth factor-I with different sources of dietary proteins in a subsample of UK Biobank study participants.

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Introduction: Circulating insulin-like growth factor I (IGF-I) is associated with higher risk of several common types of cancer1. Intake of dietary protein may be associated with IGF-I concentrations2; however, it is not well characterised how protein from different sources (e.g. animal or plant) relates to circulating IGF-I concentrations. The objective of this analysis was to assess the association of protein intake from different sources with circulating IGF-I concentrations in an observational analysis in the UK Biobank.

Methods: In this analysis, participants were selected if they completed at least four (maximum of five) web-based 24-hour dietary assessments3 and had serum IGF-I measured (n=11,815). Usual dietary protein intakes were determined by the mean of completed 24-hour dietary assessments. Multivariable linear regression was used to assess the associations of dietary protein intakes with serum IGF-I concentrations.

Results: The mean serum IGF-I concentration was 21.96 nmol/L (SD: 5.72). Consumption of 2.5% higher energy intake from total protein, protein from plants, and protein from animal sources was

associated with 0.48 (95% confidence interval: 0.40-0.56), 0.53 (0.34-0.72), 0.33 (0.25-0.41) nmol/L higher serum concentrations of IGF-I, respectively. When animal protein sources were further divided by type of dairy products, protein intake from total dairy, from milk, and from yogurt were associated with 0.73 (0.52-0.93), 1.19 (0.90-1.49), and 1.37 (0.84-1.90) nmol/L higher IGF-I concentrations, respectively, while no association was found with protein intake from cheese. A moderate association was observed for protein intake from non-dairy animal sources (0.22 nmol/L, 0.13-0.30).

Conclusion: Although total protein intake was positively associated with serum IGF-I concentrations, we found that the associations varied by protein sources; milk and yogurt protein were most strongly associated with IGF-I while there was no association for protein from cheese. The mechanism of why protein from milk or yogurt may increase IGF-I and not cheese is not known and warrants further investigation.

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19. British Agriculture: Recovery and Transformation after COVID-19

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Climate change arguably is the defining issue for future generations and necessitates international and local efforts to curtail drastic future scenarios. A major contributor to global greenhouse gas (GHG) emissions is agriculture, including the UK's agri-food sector. Yet two recent events have rocked the UK: COVID-19 and Brexit, which have both brought to light the long-existing vulnerabilities of the country's agri-food sector. Moreover, these watershed events have offered opportunity for politicians, farmers, and other stakeholders to propose nuanced ideas and policies to finally ameliorate ongoing inefficiencies in the sector. In this context, the report focuses specifically on the potential of the UK Agriculture Bill to provide new mechanisms for supporting green transition.

The bill is intended to replace the archaic and inefficient Common Agriculture Policy introduced in the early 1970s by the EU. Most important is that the proposed bill would prioritise rewarding farmers that deliver the most environmental services such as supporting biodiversity and land restoration. The Government also provides research and analysis in regards to Brexit and implications on food and farming. Moreover, the UK champions catchment-based approaches to safeguard water resources, air, and soil quality. By enhancing the notion of local nature-based solutions at the catchment scale, the country could better roll out solutions tailored to local communities and develop public-private partnerships.

This report discusses the facts around GHG emissions with reference to animal agriculture and land-management methods, and offers a set of policy recommendations based on realistic technological, institutional, and methodological opportunities.

20. Framing the Mitigation of Livestock Emissions under the International Climate Regime

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Increasingly, research indicates that the agricultural sector contributes significantly to global greenhouse gas emissions (GHGs), particularly with regards to livestock. As a result, the IPCC has recognised the importance of pursuing a sustainable global diet (often defined as one with lower consumption of livestock products) in meeting the Paris Agreement's 2ºC mitigation target. This paper seeks to identify to what extent the international climate regime has created policy space for the reduction of livestock emissions and the achievement of a sustainable global diet. The focus of the paper lies on some of the main policy documents in the international climate regime, namely the Paris Agreement 2015, Nationally Determined Contributions (NDCs) submitted under the Paris Agreement, initiatives under the Non-State Actor Zone on Climate Action (NAZCA) and the Koronivia Joint Work on Agriculture (KJWA).

Through a critical frame analysis, the paper finds that issues relating to agricultural emissions and the livestock sector are framed more strongly in food security and adaptation terms than in solely mitigation terms. As a result, reducing livestock consumption (especially in high income and high consuming countries) is not presented as an emissions solution under the regime. Nonetheless, the paper finds that the work of the Food and Agricultural Organisation (FAO) offers the potential to fill this gap of solutions coverage and introduce the idea of sustainable diet more fully into the international climate regime.